

Exhibit 7
to
Declaration of Declaration of Andrew S. Hansen
Ralph Simon v. Select Comfort Retail Corp.,
and Select Comfort Corporation
Case No.: 4:14-cv-1136 (JAR)

EXPERT REPORT OF NEIL CARLSON

Submitted on Behalf of Defendants Select Comfort Corporation and Select Comfort
Retail Corporation

June 19, 2015

Retention and Test Objective

I was retained by counsel to Defendants Select Comfort Corporation and Select Comfort Retail Corporation (“Select Comfort”) to determine whether a person would be exposed to *Cladosporium spp.* during a simulated typical night’s sleep on a Series 5000 Sleep Number® bed contaminated with the organism, as claimed by Plaintiff Simon. Testing was conducted on May 20, 2015. Mike Buck assisted me with the test and acted at my direction.

I was compensated at an hourly rate of \$150/hour. My compensation is not contingent on the outcome of the litigation.

Test Preparation

A 10 inch by 5 inch patch of bed chamber material was cleaned with 70% ethanol, rinsed with distilled water, and wiped with yeast extract in order to provide nutrition for the growth of *Cladosporium spp.* The patch of bed chamber material was then swabbed with *Cladosporium spp.* and incubated for at least 2 weeks. After incubation, the visible growth on the patch of bed chamber material was transferred onto MEA (Malt Extract Agar), TSA (Trypticase Soy Agar), and DG-18 (Dichloran Glycerol Agar) plates for verification. Growth of *Cladosporium spp.* was observed on all three growth media.

A constructed clean room was used for the test. The clean room has rough interior dimensions of 15 feet x 16.5 feet by 8 feet high. The rough interior dimensions of the anteroom are 15 x 7.5 feet x 8 feet. The total rough exterior dimensions are 24 feet x 16 feet x 8.5 feet high. A supply fan provides HEPA filtered air into the space. The fan and HEPA filters are located on top of the clean room. When the fan providing HEPA filtered air to the space is shut off, a plug is placed over the supply air inlet. See Exhibit 3.

Select Comfort no longer manufactures the 5000 Series Sleep Number® bed. Consequently, Select Comfort constructed a new 5000 Series bed solely for this test. All materials Select Comfort used in making the bed were new. The black foam that was originally used in 5000 Series beds is no longer manufactured. As a result, we substituted a yellow foam in the test bed that is more porous than the original black foam.

Prior to the test the room was purged with HEPA filtered air to remove particles and create a clean low particle environment to allow detection of small amounts of fungal spores. Air samples were taken above the bed after a rollator made a single pass over the bed for the purpose of obtaining a background room sample.

A rollator is a device used to test the durability of a bed.¹ It is also used to simulate the sleep cycle of a person lying on a bed. *See* Exhibit 3. A pass over the bed by the rollator simulates a person's change of position during sleep. In this experiment we simulated 6.75 hours of sleep, which is the length of an average night's sleep.² We used the assumption that a person changes positions every 15 minutes during an average night's sleep. The actual measured sleep position changes are less frequent, varying between 7 and 15 times per night.³

The patch of bed chamber material with *Cladosporium spp.* growth was then inserted inside the bed on top of a brand new chamber. The room was purged again with HEPA filtered air for 15 minutes.

Test Method

A rollator was run over the bed every 15 minutes for the 6.75 hours. 1000 liter air samples were taken with TSA, DG-18, and MEA plates every hour at the head of the bed using a SAS dual head sampler. A final sample was taken 45 minutes later. The SAS dual head air sampler was placed at the head of the bed to approximate the position of a person's head while sleeping. The SAS dual head air sampler was used determine culturable fungal levels. Featuring dual heads, with a powerful total flow of 360 liters per minute, the SAS Duo 360 allows for high volume air testing with two different media at once and is ideal for clean rooms where contamination levels are minimal and a higher sampling volume is desired.⁴

At each hour interval, the first door was opened and then closed. The door to the test room was then opened briefly, and the SAS dual head air sampler and a Fluke particle counter were given to Mike Buck, who was in the clean room while wearing a Tyvek suit, to perform the sampling. The fluke particle counter was used to determine particle levels in the room. It was used to determine the effectiveness of the HEPA filter and measure increases in particles due to infiltration from air outside the clean room. Upon completion of the sampling, the first door was opened and closed. The second door was

¹ *See* <http://www.schapmachine.com/ProductView/297/Fatigue+--+Life+Cycle+--+Durability/Rollator/>.

² A 2013 U.S. Gallup Poll found Americans average 6.8 hours of sleep per night. *See* <http://www.gallup.com/poll/166553/less-recommended-amount-sleep.aspx>.

³ *See* Gordon, SJ, Grimmer, KA, Trott, P., Self-Reported Versus Recorded Sleep Position: An Observational Study, *Internet Journal of Allied Health Sciences and Practice*, January 2004, Vol. 2 No. 1. Found at <http://ijahsp.nova.edu/articles/Vol2num1/pdf/gordon.pdf>.

⁴ *See* http://www.biosci-intl.com/products/sas_duo360.htm. The sampler is annually calibrated by Bio Systems International.

opened, the samplers were retrieved from Mike Buck and the door was closed. The particle counts were recorded and the labeled sample plates were taped shut to the culture plate lids.

The plates were held overnight before placement in an incubator at a temperature of 25 degrees Celsius for 8 days. The plates were kept at building room temperature (68 – 78 degrees Fahrenheit estimated) for the remainder of the experiment. All the plates were counted at 6 days and 14 days post-test. Specific plates were checked at 9 days after the test. The organisms were identified using a combination of colony morphology and visual observation with a dissecting scope. The identification of specific organisms was confirmed by taking a clear 3M Scotch tape lift from the colony. The tape lift was placed on a slide with a small amount of 85% lactic acid or 85% lactic acid mixed with Lacto fuchsin stain mounting fluid. The slide was examined under a compound microscope with magnifications up to 400x.

Summary of the Results

Particle counts in the clean room began low and then increased as the experiment went on due to the influx of air from the warehouse into the clean room. Because the fan supplying air to the room was shut off, the room no longer had air flowing out of the room maintaining a positive pressure. This allowed some of the warehouse air, which contains fungal particles, into the clean room.

Prior to the insertion of the patch of bed chamber material with *Cladosporium spp.* growth, the concentration of *Cladosporium spp.* in the clean room varied from less than 1 colony forming unit per cubic meter (“cfu/cubic meter”) to 1 cfu/cubic meter. During the 6.75 hours of the test, the concentration measured in the clean room varied from less than 1 cfu/cubic meter to 4 cfu/cubic meter. The highest count of 4 cfu/cubic meter contributes less than 5% of the average indoor fungal concentration of *Cladosporium spp.* present indoors and is not considered a significant indoor source.

Air sample volumes taken in home and office environments typically do not exceed 100 liters per minute from spring to fall in temperate climates to prevent overgrowth on the plates. Winter time samples in temperate climates may run 200 liters per minute. Minimum detection limits for these sampling methods are 10 cfu/cubic meter (100 liters) and 5 cfu/cubic meter (200 liters). These low sample volumes would not be enough to detect the highest count of 4 cfu/cubic meters found during the test.

The median outdoor *Cladosporium spp.* concentration in the U.S. in clear weather is 610 spores per cubic meter.⁵ Annual median outdoor *Cladosporium spp.* concentrations were not available for Missouri. The nearby states of Illinois and Ohio reported median

⁵ See EMLab P&K, *IAQ Pocket Reference Guide*, (7th ed. 2012) at p. 24.

outdoor *Cladosporium spp.* spore levels of 693⁶ and 838⁷ spores per cubic meter respectively. Mean *Cladosporium spp.* counts in colony forming units per cubic meter for the Midwest are 130 cfu/cubic meter indoors and 550 cfu/cubic meter outdoors.⁸

Conclusion

During a simulated typical night's sleep with this amount of *Cladosporium spp.* growth on the bed chamber material, there was no exposure to the organism above the typical outdoor concentration of 550 cfu/cubic meter or the typical indoor concentration of 130 cfu/cubic meter.



Neil G. Carlson, MS CIH
N.G. Carlson Analytical, Inc.

⁶ *Id.* at p. 29.

⁷ *Id.* at p. 31.

⁸ See B.G. Shelton et al, *Profiles of Airborne Fungi in Buildings and Outdoor Environments in the United States*, Appl. Environ. Microbiol., 2002 Apr, 68(4), at pp. 1743–53; see also <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC123871/table/t5/>.

Exhibit 1: Air sample results

MEA – Air samples from Chamber study on May 20, 2015. Samples checked 5/26/2015, 5/29/2015 and 6/3/2015.

Location	volume	Cfu/cubic meter	organisms	Comment
1. Background outside building – DG-18 2:11	100 liters	360	Cladosporium spp. (17) Penicillium spp. (5) Aspergillus spp. (1) Other (13)	
2. Warehouse – DG-18 2:15	100 liters	2,210*	Penicillium spp. (100) Cladosporium spp. (20) Aspergillus spp. (1) Other (100)	Overgrowth on plate count is an estimate.
3. Clean room background – no rollator movement TSA 2:35	1000 liters	5	Penicillium spp. (3) Cladosporium spp. (1) Aspergillus spp. (1)	
4. Rollator control rollator moved one pass over bed TSA 2:40	1000 liters	8	Penicillium spp. (5) Aspergillus spp. (1) Other (2)	
5. Inserted sample - Post HEPA run for 15 minutes TSA 3:08	1000 liters	5	Penicillium spp. (3) Other (2)	
6. Rollator first cycle – 9am TSA 3:15	1000 liters	12	Penicillium spp. (8) Aspergillus spp. (1) Stachybotrys spp. (1) Other (2)	
7. Rollator second cycle – 10 am TSA 4:15	1000 liters	27	Penicillium spp. (13) Aspergillus spp. (9) Chaetomium spp. (1) Other (4)	4 cycles
8. Rollator third cycle – 11 am TSA 5:15	1000 liters	26	Penicillium spp. (21) Aspergillus spp. (1) Other (4)	
9. Rollator 4 th DG-	1000 liters	46	Penicillium spp. (27)	

18 6:15			Aspergillus spp. (9) Cladosporium spp. (4) Other (6)	
10. Rollator 5 th cycle – DG-18 7:15	1000 liters	40	Penicillium spp. (30) Aspergillus spp. (6) Aspergillus fumigatus (1) Other (3)	
11. Rollator 6 th cycle – DG-18 8:15	1000 liters	32	Penicillium spp. (22) Aspergillus spp. (7) Cladosporium spp. (1) Other (2)	
12. Rollator 7 th cycle – DG-18 9:15	1000 liters	30	Penicillium spp. (18) Aspergillus spp. (2) Other (10)	
13. Warehouse (50 liters) – TSA 9:30 pm	50 liters	1220	Aspergillus spp. (30) Penicillium spp. (26) Cladosporium spp. (1) Other (4)	
14. Rollator 7 th cycle – DG-18 10 pm	1000 liters	21	Penicillium spp. (13) Aspergillus spp. (4) Other (4)	
1. Control plate #1	0 liters	No growth	none	
2. Control plate #2 MEA	0 liters	2	Aspergillus niger Aspergillus fumigatus	
3. Positive control inoculated plate MEA	0 liters	Growth	Cladosporium spp.	

DG-18 and TSA – Air samples from Chamber study on May 20, 2015. Samples checked 5/26/2015, 5/29/2015 and 6/3/2015.

Location	volume	Cfu/cubic meter	organisms	Comment
1. Background outside building – DG-18 2:11	100 liters	360	Cladosporium spp. (26) Penicillium spp. (2) Aspergillus spp. (1) Alternaria spp. (1) Other (6)	
2. Warehouse – DG-18 2:15	100 liters	3,950*	Penicillium spp. (280) Cladosporium spp.	Overgrowth on plate count is

			(62) Aspergillus spp. (50) Rhizopus spp. (2) Aspergillus niger (1)	an estimate.
3. Clean room background – no rollator movement TSA 2:35	1000 liters	4	Penicillium spp. (1) Other (3)	
4. Rollator control rollator moved one pass over bed TSA 2:40	1000 liters	16	Penicillium spp. (1) Cladosporium spp. (1) Aspergillus spp. (2) Other (12)	
5. Inserted sample - Post HEPA run for 15 minutes TSA 3:08	1000 liters	13	Penicillium spp. (2) Cladosporium spp. (2) Other (9)	
6. Rollator first cycle – 9am TSA 3:15	1000 liters	19	Penicillium spp. (9) Other (10)	
7. Rollator second cycle – 10 am TSA 4:15	1000 liters	40	Penicillium spp. (18) Aspergillus spp. (5) Other (17)	4 cycles
8. Rollator third cycle – 11 am TSA 5:15	1000 liters	38	Penicillium spp. (14) Aspergillus spp. (7) Other (17)	
9. Rollator 4 th DG-18 6:15	1000 liters	42	Penicillium spp. (19) Aspergillus spp. (8) Cladosporium spp. (2) Other (13)	
10. Rollator 5 th cycle – DG-18 7:15	1000 liters	54	Penicillium spp. (32) Aspergillus spp. (19) Cladosporium spp. (1) Eurotium spp. (1) Other (1)	
11. Rollator 6 th cycle – DG-18 8:15	1000 liters	43	Penicillium spp. (26) Aspergillus spp. (14) Other (3)	
12. Rollator 7 th	1000 liters	25	Penicillium spp. (13)	

cycle – DG-18 9:15			Aspergillus spp. (8) Cladosporium spp. (1) Other (3)	
13. Warehouse – TSA 9:30 pm	50 liters	840	Penicillium spp. (27) Aspergillus spp. (12) Cladosporium spp. (3)	
14. Rollator 7 th cycle – DG-18 10 pm	1000 liters	33	Penicillium spp. (19) Aspergillus spp. (10) Eurotium spp. (2) Cladosporium spp. (1) Other (1)	
15. Control plate DG-18	0 liters	No growth	none	
16. Control plate DG-18 #2	0 liters	No growth	none	
17. Control plate TSA #1	0 liters	2	Aspergillus fumigatus Aspergillus niger	
18. Positive control inoculated plate - TSA	0 liters	growth	Cladosporium spp.	
19. Positive control inoculated plate – DG-18	0 liters	growth	Cladosporium spp.	

Exhibit 2: Particle counts

Location	Particle size	Particle counts	Temp data	Notes
1. Background outside building –2:11				
2. Warehouse – 2:15			DB 19.1 WB 13.5 C	Calibration DB 46.3 – read 46.1
3. Clean room background – no rollator movement 2:35				
4. Rollator control rollator moved one pass over bed 2:40				
5. Inserted sample - Post HEPA run for 15 minutes 3:08	0.3 0.5 1.0 2.0 5.0 10.0	4245 3332 4567 430 376 0	DB 19.3 WB 14.1	Room pressure 68 Pascals positive with door slightly open when HEPA on
6. Rollator first cycle – 9am 3:15	0.3 0.5 1.0 2.0 5.0 10.0	3644 2650 3589 387 718 497		
7. Rollator second cycle – 10 am 4:15	0.3 0.5 1.0 2.0 5.0 10.0	8939 5662 8634 668 1463 64		4 cycles for rollator
8. Rollator third cycle – 11 am 5:15	0.3 0.5 1.0 2.0 5.0 10.0	10065 7122 13714 1883 2295 0		

9. Rollator 4 th 6:15	0.3	12896		
	0.5	9839		
	1.0	15064		
	2.0	16668		
	5.0	889		
	10.0	0		
10. Zeroed filter	0.3	0		
	0.5	0		
	1.0	0		
	2.0	0		
	5.0	0		
	10.0	0		
11. Rollator 5 th cycle – 7:15	0.3	incomplete	DB 19.3 WB 14.9	
	0.5			
	1.0			
	2.0			
	5.0			
	10.0			
12. Warehouse	0.3	504679		
	0.5	321114		
	1.0	467110		
	2.0	42877		
	5.0	42227		
	10.0	1450		
13. Rollator 6 th cycle – 8:15	0.3	20100		
	0.5	16141		
	1.0	21128		
	2.0	1872		
	5.0	1332		
	10.0	38		
14. Zeroed filter	0.3	0		
	0.5	0		
	1.0	0		
	2.0	0		
	5.0	10		
	10.0	40		
15. Rollator 7 th cycle – 9:15	0.3	25776	DB 19.5 C WB 15 C	
	0.5	17630		
	1.0	23186		
	2.0	1295		
	5.0	1253		
	10.0	42		
16. Warehouse 9:30 pm	0.3	506700		
	0.5	216963		
	1.0	253645		
	2.0	17426		

	5.0	13897		
	10.0	300		
17. Particle count zero	0.3	0		
	0.5	0		
	1.0	0		
	2.0	0		
	5.0	0		
	10.0	0		
18. Rollator 7 th cycle – 10 pm	0.3	28608		
	0.5	19761		
	1.0	23152		
	2.0	1511		
	5.0	1449		
	10.0	92		

Exhibit 3: Clean room and rollator
Pictures from Chamber study on May 20, 2015.



Test Chamber with *Cladosporium spp.* on the new bed at end of experiment



Photo of *Cladosporium spp.* chamber material piece and the back side of foam material at end of experiment on May 20, 2015



Rollator used to simulate sleeping cycle. SAS air sample was taken at this end of the bed.



Rollator at rest position side view.



Rollator position at rest.

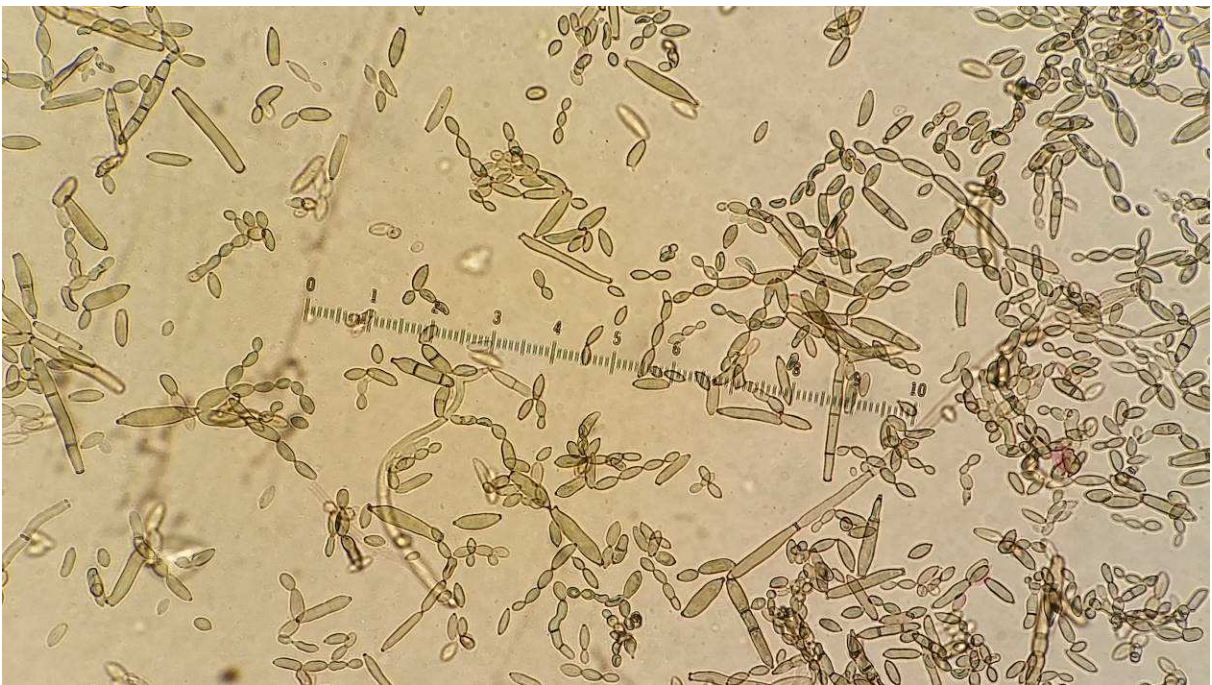


Double door entrances to testing area.

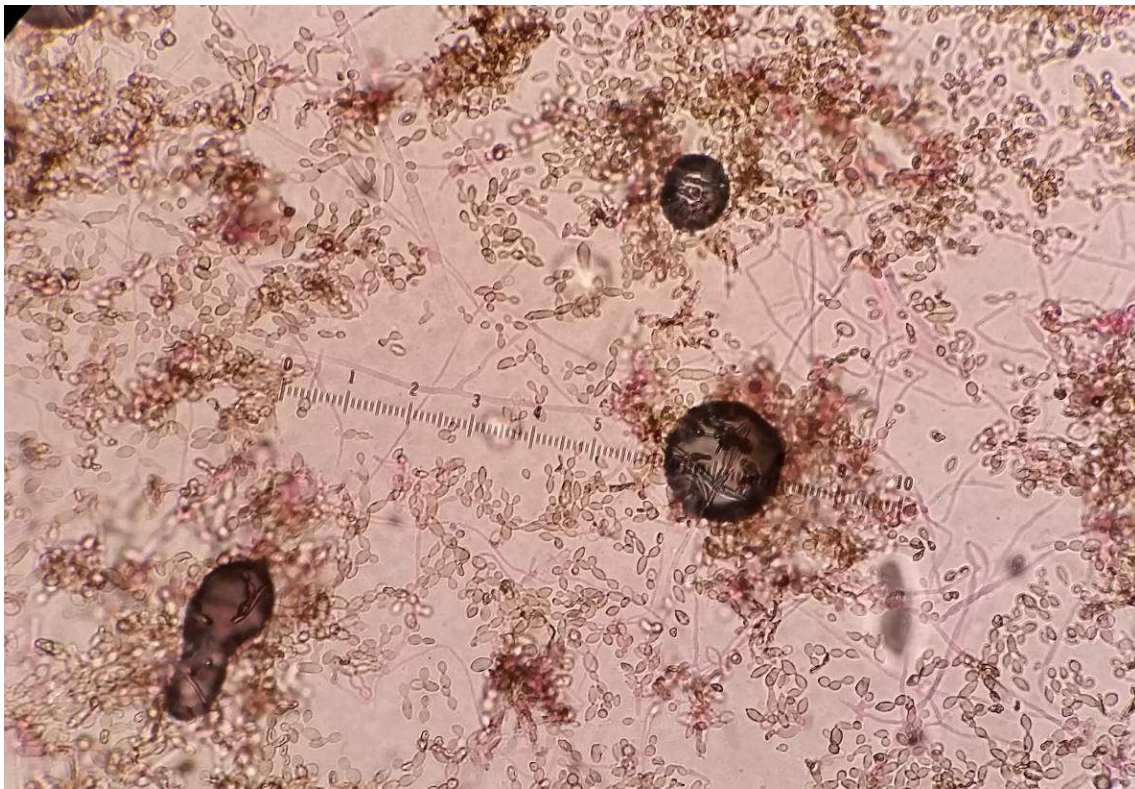
Exhibit 4: Media growth
Pictures from Chamber study on May 20, 2015.



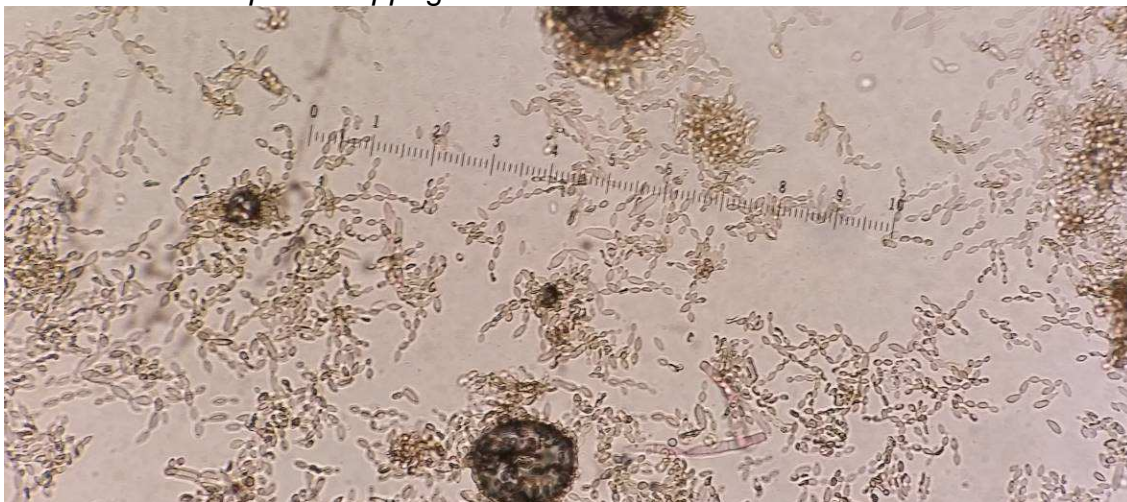
Positive control test from chamber material - *Cladosporium* spp. growth on MEA, TSA and DG-18 agar.



Picture of *Cladosporium* spp. growth on DG-18



Picture of *Cladosporium* spp. growth on TSA



Picture of *Cladosporium* spp. growth on MEA

Exhibit 5: Chamber and culture photos

Pictures from Chamber study on June 3, 2015.



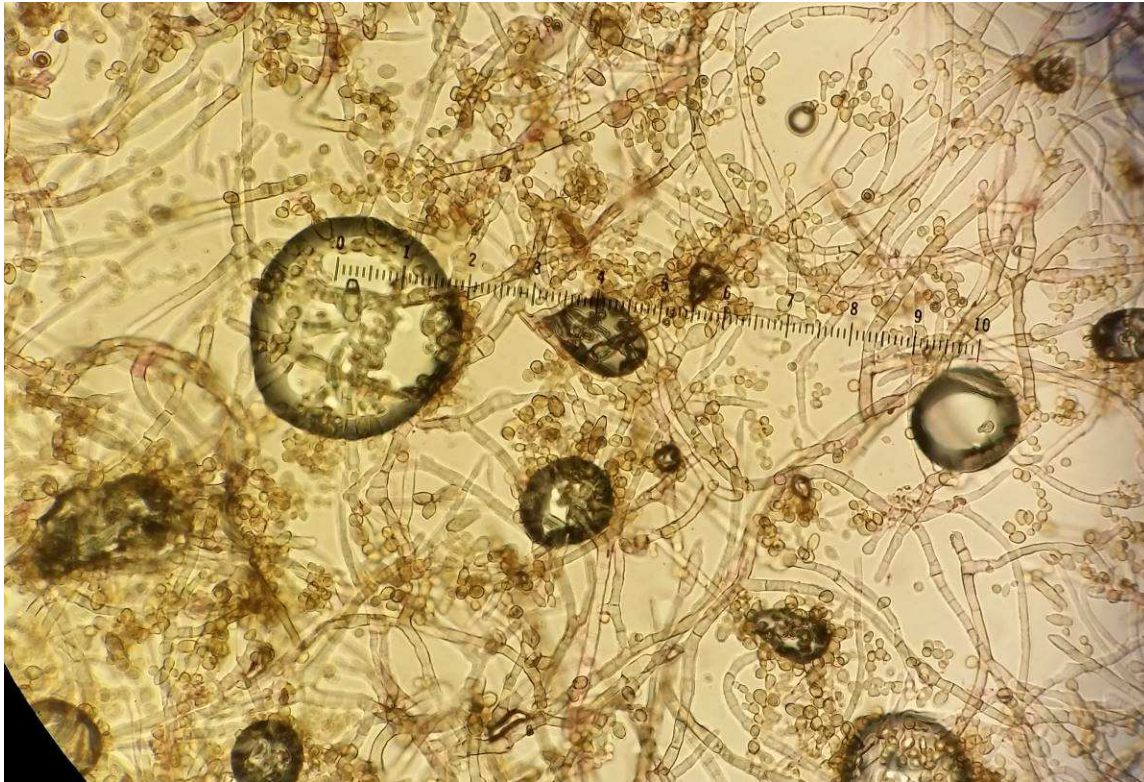
Chamber study: *Cladosporium* spp. growth on yeast extract



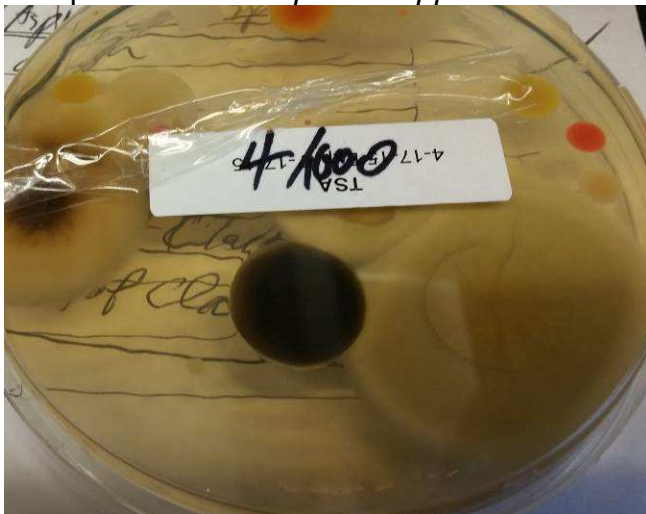
Chamber study: *Cladosporium* spp. growth on yeast extract.



Sample #3 1 *Cladosporium* spp.



Sample # 3: *Cladosporium* spp. - Clean room background



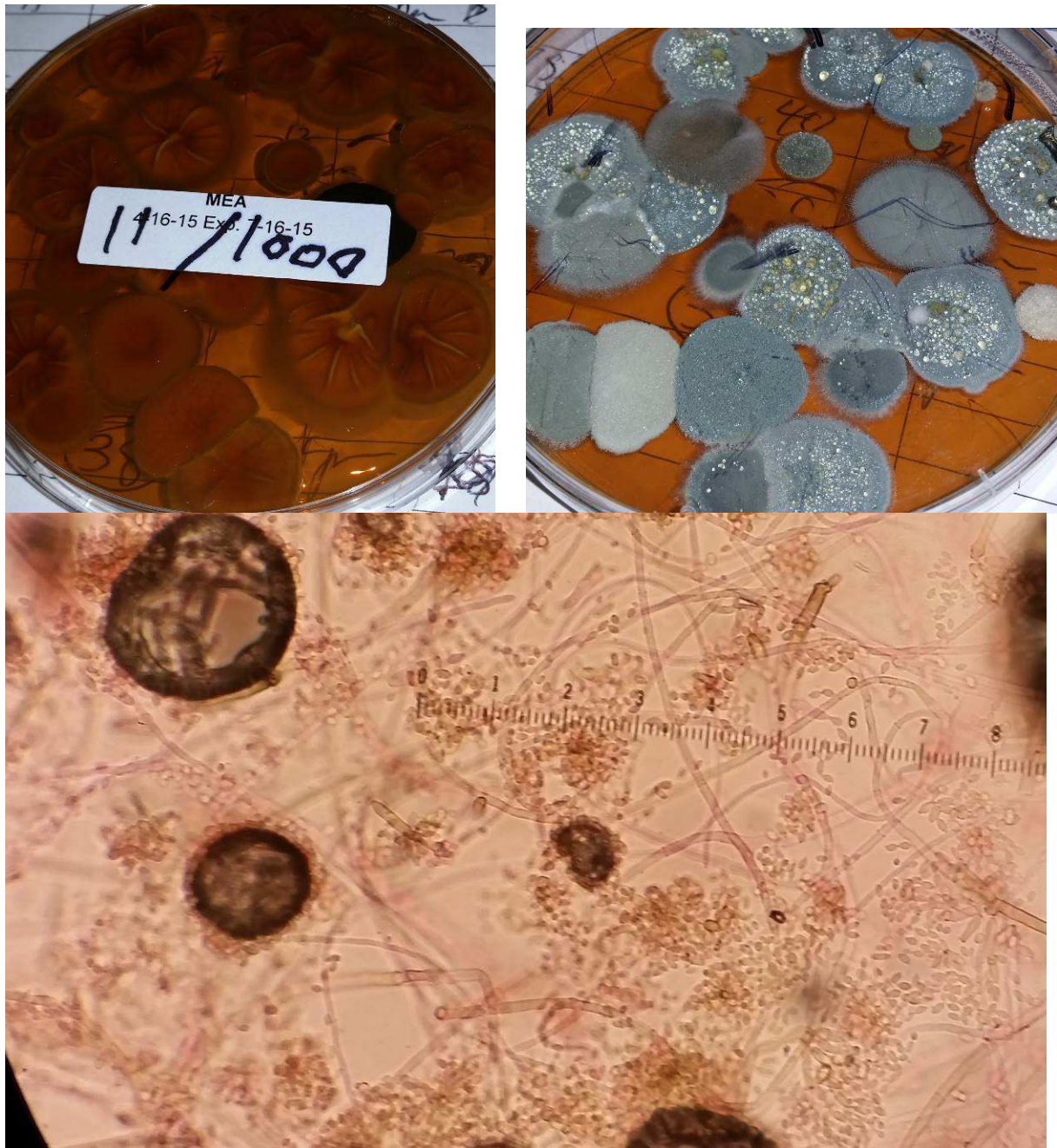
Sample #4 *Cladosporium* spp.



Sample #4 *Cladosporium* spp. Clean room control rollator one pass – No *Cladosporium* spp. added.



10 *Cladosporium* spp. Rollator #5 cycle



Sample # 11 *Cladosporium* spp. #6 cycle.

EXHIBIT 6

Neil G. Carlson

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New Brighton, MN 55112

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Professional experience

Public Health Specialist [July, 1989-Present] University of Minnesota
Department of Environmental Health and Safety Minneapolis, MN

Coordinated indoor air program. Developed Standard Operating Procedure for Fungal Abatement with Facilities Management. Provided training on fungal awareness to each Facilities Management Zone, the Real Estate Office and Building Codes. Served as team lead and functional supervisor for indoor air quality program and WET Force report. Reviewed and provided feedback on memos. Provided work direction. Assisted in employee evaluation.

Developed U of MN office ergonomics program. Provided training to departments and outstate campuses on office, kitchen, laboratory and agricultural ergonomics. Conducted ergonomic evaluations in offices, labs, kitchens, custodial and agricultural settings. The program received a CSHEMA award for a unique and innovative safety program.

Co-chair and member of U of MN AFSCME/Management Committee on Office Ergonomics (1992 to Present). The committee received an Award of Merit from the Twin Cities Labor Management Council.

Assisted with certification of BSL-3 Facilities on the St. Paul Campus.

Incident commander for chemical spill response and floods.

Chaired Departmental Web Committee. Served as principle content expert for DEHS Web sites on Ergonomics and Indoor Air Quality

Assisted with plan reviews, chemical monitoring, animal allergen sampling and waste anesthetic gas monitoring.

Received access achievement award from U of MN Disability Services in October 2011.

Safety Technician [July 1988- June, 1989] University of
Minnesota Department of Environmental Health and Safety Minneapolis,
MN

Employee right to know program coordinator, monitored chemical exposures, Investigated and resolved indoor air complaints, Responded to chemical spills.

Environmental Microbiology Lab Aid [1987 – 1988] University of Minnesota Division of Occupational Health and Safety

Editor-in-Chief [1985 – 1986] Morris Weekly, U of MN Morris, campus student newspaper. Supervised ten employees. Developed budget. Served as staff photographer. Assisted with news layout, news reporting, proof reading and assigning news stories.

News Editor [1984 – 1985]– Morris Weekly, U of MN Morris, campus newspaper

Teaching Assistant [1984- 1986] General Psychology, University of Minnesota, Morris.

Natural Science Judge at County Fairs[1984 - 1986] Minnesota Extension Service

Education

September 1982 – June 1986 University of Minnesota, Morris

Major: Biology Minor: Chemistry

- Additional coursework in Computer programming, Environmental Geology, Speech Communications, Theatre, Movies and Choreography.
- Truman Scholarship nominee

September 1986 – June 1988 University of Minnesota, Twin Cities

Master of Science

- Completed coursework in General Environmental Health with emphasis in Industrial Hygiene, Toxicology, Injury Prevention, Health Risk Evaluation, Scientific Writing and Environmental Health Administration.
- Interned at Community Health Service in Marshall, MN. Assisted the sanitarian. Conducted Agricultural Health and Safety injury survey. Provided occupational health monitoring in agricultural environment. Developed radon survey for the four county area.
- Completed a plan B study on lead levels in Radiator Repair shops

September 1991 – June 1994 University of Minnesota, Twin Cities
Additional Graduate coursework in Ventilation, Particles and Health, Intro to Human Factors Engineering, Indoor Air Quality, Building Science, Biochemistry, Mycology, Statistics and Medical Microbiology.

Publications
Poster Sessions
Presentations

Publications:

High levels of carbon monoxide are produced by electro-cautery of tissue during laparoscopic cholecystectomy, D.S. Beebe, H. Swica, **N. Carlson**, R.J. Palahniuk, R.L. Goodale (1993) *Anesth. Analg.* Vol. 77: p. 338 – 341.

Managing water infiltration in buildings, A. Quraishi, **N.G. Carlson**, (1999) *Public Risk*, May-June, p. 38-39.

Ventilation requirements in a retail store, D.T. Grimsrud, B.B Bridges, B.B., **N.G. Carlson**, D.E. Hadlich (1999) *Indoor Air 99 Proceedings*, Vol. 2. p. 332 – 337.

Floor Coverings for Basements and Below-grade Space, D. Ginther, W. Olson, **N. Carlson** (1999) U of MN Extension Service.

Category I: Antimicrobial Pesticides – Pesticide Applicator Safety Education Manual: 2010 Indoor Mold, HVAC, and Cooling Towers, N. Carlson, R. Fearer, D. Herzfeld, P. Huelman, K. Norlien, K. Sargent, J. Spitzmueller (2010) University of Minnesota Extension. 140p.

A comprehensive plan to reduce losses from water damage at a University, NG. Carlson, K. Mullane, (2014) *Journal of Chemical Health and Safety*, Vol 21: Issue 6. p 28-33.

Poster sessions:

Carbon Monoxide Monitoring of Parking Lots. C. Colton, C Bates, T. Smith, **N. Carlson**, L.M. Brosseau. AIHCE Salt Lake City Utah, May, 1991.

Assessment Methods for Mold Remediation. **N.G. Carlson**, D.E. Errede, J.L. Lauer, A.J. Streifel, AIHCE Anaheim CA, May, 1994.

Quality Assurance Methods Used During the Remediation of Fiberglass Lined Ductwork with Fungal Contamination. **N.G. Carlson**, A.J. Streifel, AIHCE Washington, DC – May, 1996.

Anatomy of a Non-viable Fungal Problem. A. Quraishi, **N.G. Carlson**,

Third International Conference on Mycotoxins and Health, Saratoga Springs, NY – September, 1998.

A Method to Evaluate the Cleaning Effectiveness and Airborne Particle Generation of Vacuum Cleaners, C. Henckel, A. Quraishi – **N. Carlson**, A. Streifel, AIHCE, Orlando, FL- May, 2000.

Effects of Various Control Measures on the Concentrations of Airborne Laboratory Mouse Urine Proteins – R.M. Burton, V. Ramachandran, M. Austin, **N. Carlson**, AIHCE Indianapolis, IN – May 2012.

Paper presentation(co-author):

Anesthetic Gas Equipment Surveillance and Maintenance at a University Hospital, A.J. Streifel, E. Oberg, **N. Carlson**, AIHCE, Kansas City, Missouri – May, 1995.

VAV/Manifolded Exhaust Systems Issues and Observations. M. Austin, **N. Carlson**, AIHCE Washington, DC – May, 1996.

Refinement of Methods for Particle Analysis of Indoor Air in Health Care Facilities. A.J. Streifel, D. Errede, **N. Carlson**, AIHCE 2001.

Use of Infrared Imaging and Moisture Meters to Accurately Characterize Areas of Water Damage. **N. Carlson**, Podium Session PO119, 2008 AIHce in Minneapolis, MN June 3, 2008

Investigation of Appropriate Ventilation Rates for Retail Stores. David T. Grimsrud, Neil Carlson, Barry Bridges, Tony Springman. Podium presentation. Indoor Air 2011 June 5-10, 2011 Austin, TX.

Presentations:

Indoor Air Quality Investigations/Mold Sampling Strategies, Big Ten Health and Safety Conference, Minneapolis, MN – September, 1992.

Several Analytical Procedures for Evaluation of Indoor Air Problems, Midwest Environmental Laboratory Conference, St. Paul, MN - February, 1994.

Microbial Contamination in Indoor Environments, Institute for Environmental Assessment, Brooklyn, Park. - February, 1994.

Environmental Illness in Indoor Air Quality, Minneapolis Retired Teachers Association, Minneapolis, MN - March, 1994.

Microbial Evaluation of Remediation Techniques Used for Water Damaged Carpet and Gypsum Board, CSHEMA, St. Lake City, UT – July, 1997.

What do Microbial Analysis Really Tell You, Institute for Environmental Assessment, Brooklyn, Park. - March, 1998.

Microbial Abatement: Learning from Case Studies, Institute for Environmental Assessment, Brooklyn, Park. - May, 1999.

Managing Water Infiltration into Buildings, Public Risk Managers Association, San Diego, CA - June, 1999.

Managing Water Infiltration into Buildings, Midwest EHS Big 10 RSO East Lansing, MI - September, 1999.

Avoiding Indoor Microbial Problems Through Better Maintenance and Construction, Institute for Environmental Assessment, Brooklyn, Park, MN - December, 1999.

Carpet Management – Water Intrusion and Clean-up, Department of Children Families and Learning, Carpet Maintenance Workshop – March, 2001.

Flooding: Strategies for Cleaning and Drying, U of MN Extension Service: Staff Development Conference, Minneapolis, MN – May, 2001.

Mold and Fungal Growth in Buildings, The Engineer's Club of Minneapolis, Minneapolis, MN - October, 2001.

Preventing Repetitive Stress Injuries in Office Environments, Minnesota Turf and Grounds Foundation, Minneapolis, MN – December, 2001.

Mold! Science vs. Speculation, Panel Discussion, F. Terracina, **N.G. Carlson**, as part of 2 day seminar: Indoor Air Quality and the Renaissance of the American Building, Institute for Environmental Assessment, Bloomington, MN – October, 2002.

Mold in housing, North Central Regional Conference on Mold, Lead Health Homes and Children's Environmental Health, Minneapolis, MN – October, 2002.

Dealing with Mold Issues, Bloomington Rental Housing Collaborative, Bloomington, MN – October, 2002

Evaluating the Case a Reality Check, **N.G. Carlson** and Philip Sieff, Minnesota Bar Association as part of 2 day seminar: Mold: Why Mold? Why now?, Minneapolis, MN - October, 2002.

Investigating and Interpreting Results, Minnesota Bar Association as part of a day long seminar: When Mold Takes Hold, Minneapolis, MN - April, 2003.

Remediation: It Can Be a Nightmare, Minnesota Bar Association as part of a day long seminar: When Mold Takes Hold, Minneapolis, MN - April,

2003.

Mold Awareness for Residential Appraisers, NAIFA regional conference, Hinkley, MN April, 2003.

Mold investigation and Mold Ecology, Midwest Hospital Engineers Association, St. Cloud, May, 2003.

Mold in Buildings, BWBR Architects, St. Paul, MN, May, 2003

Mold a Growing Problem on Campus, **N. Carlson**, S. Rafferty, K. Larson, National Association of College and University Attorneys 43rd Annual Conference, Minneapolis, MN - June, 2003.

Mold and insurance issues, Insurance Extravaganza, Prior Lake, MN – August, 2003

Mold Remediation, Hospital Infection for Construction and Infection Control Strategies, Midwest Hospital Engineers Association, Mahanomen, MN, September, 2003.

Moisture and Mold – Building and Human Impact, 9th Annual Indoor Air Quality Conference, Improving the Built Environment, Bloomington, MN - October 31, 2003.

Mold and IAQ investigation, Centerpoint Energy 2003 Technology Conference– November 5, 2003

Mold Recognition and Testing, 48th Annual Institute for Building Officials – St. Paul, MN - January, 2004.

Mold Recognition and IAQ, MN Building Officials Meeting, Maple Grove, MN October 20, 2004.

Health Effects of Indoor Air Quality, **N.G. Carlson** and William J. Angell, Minnesota Interior Design Legislative Action Committee – St. Paul, MN May 4, 2006.

Moisture related construction defects IR photos and particle ID, MN Indoor Air Association, Elk River, MN March 29, 2007.

Laboratory Ergonomics – web broadcast – National Laboratory Training Network – April 16, 2007.

Making Foreclosure Rehabs work, Habitat for Humanity, St. Cloud, MN – March 6, 2008.

Ailing Homes Breed an Industry Minnesota Bar Association, Minneapolis, MN - March, 2008.

Use of Infrared Imaging and Moisture Meters to Accurately Characterize Areas of Water Damage, N.G. Carlson, AIHce – Minneapolis, MN June 3, 2008.

SE Minnesota Flood Response, Minneapolis Chapter of the Indoor Air Association, St. Paul, MN June 23, 2008.

Making Foreclosure Rehabs work, Midwest Center for Occupational Health and Safety, Minneapolis, MN November, 2009.

Fungal investigation, Pesticide applicator refresher course, Chanhassen, MN November, 12, 2009

Indoor Allergen, Minneapolis Chapter of the Indoor Air Association, St. Paul, MN December 1, 2009.

Here's to Your Environmental Health: Chemical Sensitivity and the Workplace, Jewish Family and Children's Service, Minnetonka, MN June 8, 2010.

Water Event Task Force Results – CSHEMA National meeting July, 2011

Water Event Task Force Results – web broadcast – CSHEMA December, 2011

Additional professional activities

President of NG. Carlson Analytical Inc. a corporation specializing in fungal identification and indoor air evaluation. (1990's – Present)

AIHA Laboratory Safety Committee member (May 1993 – May 1995).

Developed website on School Indoor Air Quality working on a committee with American Lung Association, MN Health Department., Legislators, school district personnel and environmental consultants (1992).

Instructor at Annual Health Care and Construction Workshops – Minnesota Extension Service, Minneapolis, MN (1996 – 2001).

Instructor at Annual Recognition and Mitigation of Indoor Air Quality Issues – Midwest Center for Occupational Health and Safety, St. Paul/Minneapolis, MN - (2000 – 2002).

Instructor and program developer for at two and three day Mold Id Workshop – Midwest Center for Occupational Health and Safety (2002 – 2008).

Instructor and program developer for annual two day mold remediation

workshop – Midwest Center for Occupational Health and Safety (2011 - 2013)

Instructor and program developer of annual Mold and Mold Remediation Workshop – Minnesota Extension (Fall, 2002 and Fall, 2003).

Instructor and program developer for training on Office Ergonomics, Kitchen Ergonomics and Custodial Maintenance Ergonomics – Minnesota Dept. of Children Families and Learning. Provided training over 30 ergonomic workshops in Minnesota for employees of K-12 schools (1998 – 2003).

Instructor at series of four workshops on post flooding problems from the 1997 Minnesota Floods, Minnesota Extension Service, Winter, 1998.

Member of MN legislative task force with MDH and MDA on the use of antimicrobial pesticides in residences (2007)

Developed manual with the MN Dept of Ag and Health for the use of pesticides in building remediation for the Minnesota Department of Agriculture (2009 -2010)

Instructor and program developer for 1.5 day workshop on Mold identification – Midwest Center (2013)

Continuing Education

Hazardous Materials Level 1 (45 hours), Hennepin Technical Institute, May, 1989.

Chemical Exposures: Emergency Response and Management, Midwest Center for Occupational Health and Safety, St. Paul, MN, September, 1989.

AHERA Asbestos Abatement Project Designer, University of Wisconsin, Madison WI, March 1990.

Hazardous Materials Refresher Training, Minneapolis, MN, Spring Quarter, 1990.

Bioaerosol Monitoring Workshop – Phillip Morey, AIHCE, Salt Lake City, May, 1991.

Indoor Air Quality Orientation for Public Officials, U of MN Extension, St. Paul, MN, January, 1992.

Environmental Illness – Assessment Methodology, American College of Allergy and Immunology, Chicago, IL, November, 1992.

Indoor Air Quality Symposium, AIHCE Anaheim CA, May, 1994.

OSHA's Proposed Indoor Air Quality Rule, Midwest Center for Occupational Health and Safety, Minneapolis, MN - August, 1994.

Controlling Tuberculosis in the Workplace, Midwest Center for Occupational Health and Safety, Minneapolis, MN – August, 1994.

Mold in Residential Buildings, University of Minnesota Department of Design Housing and Apparel. St. Paul, MN – September, 1994.

Identification of significant species of *Aspergillus* and *Penicillium*, National Laboratory Training Network, San Antonio, Texas - August, 1995.

Cooling Towers and Legionnaire's Disease, MN Dept. of Health, Minneapolis, MN – March, 1996.

Introduction to Food and Airborne Fungi – University of Ottawa – June, 1997.

Emerging Infections Diseases, Midwest Center for Occupational Health and Safety, Minneapolis, MN September, 1997.

Current Issues Related In Indoor Air Quality, Midwest Center for Occupational Health and Safety, Minneapolis, MN September, 1997.

Health and Safety Issues related to the floods – Midwest Center for Occupational Health and Safety, Minneapolis, MN – September, 1997.

Third International Conference on Bioaerosols, Fungi and Mycotoxins, Saratoga Springs, NY – September, 1998.

Emergency Response Training – Incident Command – Minnesota Safety Council, St. Paul, MN- March, 1999.

Universal Design in the Workplace, U of MN Disability Services Minneapolis, MN – May, 1999.

On our soil – Responding to Terrorist Threats – PRIMA – San Diego, CA - June, 1999.

Combating Chemical and Biological Terrorism – Big 10 Radiation Safety Officers Conference - September, 1999.

Online Learning '99 and Performance Support '99, Lakewood Conferences, Los Angeles, CA – October, 1999.

Pitt on *Penicillium*, National Laboratory Training Network, New Orleans, LA - April, 2000.

Indoor Air Quality: Microscopy of Dust, Spores and Pollen, John Shane–McCrone Research Institute, Chicago, IL – June, 2001.

Evacuation Coordination: Train-the-Trainer - Midwest Center for Occupational Health and Safety, Minneapolis, MN – March, 2002.

Professional Development Course – AIHA-UMS 2003 Topic covered include analysis of mold samples, HVAC cleaning standards, general safety topics. St. Paul, MN– November, 2003.

Preparedness in the workplace training and research activities – U of MN, Minneapolis, MN - February 17, 2005

Mold in the Build Environment, Satellite Web Broadcast – ASHRAE – April, 2005.

2003 IBC Hazardous Materials, International Code Council, Maplewood, MN - November 16, 2005.

Emergency management courses ICS 1, 3, 5, 7, 100, 200, 700, 800A-FEMA online course – Jan – Feb, 2007.

Intermediate ICS 00300 Expanding incidents for first Responders. Minneapolis, MN – August 18-20, 2009.

IAQ/Mold 101 Webinar Benefits of Screening IAQ contaminants 1 hour webinar – Pure Air Control Services Inc. – January 12, 2010.

NORA Symposium - National Occupational Health Research Agenda – UM SPH - April 15, 2010

Control Strategies for Chemical and Biological Hazards – online training – U of MN, SPH – January 4, 2011

Best Management Practices for Animal Research Worker Safety -online training – U of MN, SPH – June 6, 2011

Maintenance Best Practices – Four hour hands on training seminar using Fluke Thermal Imaging – August 26, 2011

Ethics in the Practice of Industrial Hygiene, U of MN SPH
Minneapolis, MN – September 21, 2011.

AIHA UMS Section Annual PDC, U of MN SPH
Minneapolis, MN – November 17, 2011

Ergoexpo Educational Webinar from HP – National Ergonomics Conference and Exposition – January 11, 2012

NORA Symposium – Inspiring a Respectful Workplace, U of M SPH
Minneapolis, MN – May 1, 2012

Fungal Data interpretation 2 hour Webinar - EmLab P&K – June 6, 2012.

AIHA UMS professional Development Conference, U of MN SPH
Minneapolis, MN – November 15, 2012.

Office of the Future: Incorporating Touch and Sit/Stand into Workstation Design – ErgoExpo Educational Webinar – January 13, 2013

Proven Ergonomics and Safety Team Building Strategies – National Ergonomics Conference and Exposition – February 13, 2013.

Catching Your Breath: Work Related Asthma in MN – Kathy – AIHA-UMS – February 21, 2013

Mold Sampling, Health Effects, and Data Interpretation 3 hour Webinar – EmLab P&K – February 7, 2013.

Control Strategies for Physical Hazards – online training – U of MN, SPH – April 10, 2013

Recognition and Assessment: Chemical and Biological Hazards – online training – U of MN, SPH – April 10, 2013

Unsafe Acts/Unsafe Conditions – online training – U of MN, SPH –

April 10, 2013

NORA symposium: Gun Violence Prevention with Implications for Occupational Health – May 2, 2013

IS-00015.b Special Events Contingency Planning for Public Safety Agencies – June, 2013

Noise and Application of EARfit training – Dan Westrum – UMS AIHA September 19, 2013.

Campus Laboratory Hazards and Tragedies - Unique Challenges and Solutions – AIHA 2 hour Webinar. November 8, 2013.

AIHA UMS professional Development Conference, U of MN SPH Minneapolis, MN – November 21, 2013.

Fungal Aerosol Variability and Data Interpretation 1 hour Webinar – EmLab P&K – December 18, 2013.

Chemical Hazard Awareness for Public Health Workers– online training – U of MN, SPH – February 8, 2014.

Professional
memberships and
Certifications

Industrial Hygienist in Training 1992 – 1994.

Certified Industrial Hygienist 1994 to present

American Industrial Hygiene Association, 1992 to present

Minnesota Indoor Air Association – Board Member 2005 to 2007

Secretary Elect Local AIHA chapter (2013)

Secretary Local AIHA chapter (2014)

Community Service

Adult and Sunday School teacher, Faith UMC St. Anthony MN -1990 to 2011.

Volunteer, Wilshire Park Elementary St. Anthony MN - 2007 to 2013.

Coach, St. Anthony Sports Boosters, St. Anthony, MN 2008 to 2010.

Destination Imagination Team manager, Wilshire Park Elementary 2011 -

2012

Parade coordinator St. Anthony Villagefest 2013- 2015

Web sites and blogs

DEHS departmental blog

<http://dehsumn.blogspot.com/>

DEHS ergonomics blog

<http://dehsumnergo.blogspot.com/>

U of MN WET force blog

<http://umnwetforce.blogspot.com/>

NG Carlson Analytical Inc

<http://sites.google.com/site/ngcarlsonanalyticalinc/>

Sustainable Mycology

<http://sustainablemycology.blogspot.com/>

Ergonomics Today

<http://ergonomicstoday.blogspot.com/>

Books for your mind

<http://booksforyourmind.blogspot.com/>